

Ultra-Compact Transmitter for Space-Based Lidar, Phase I

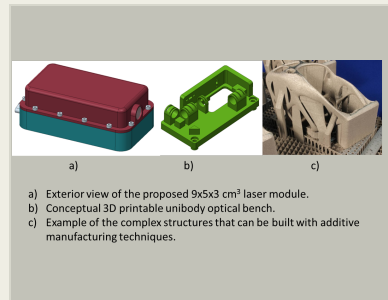
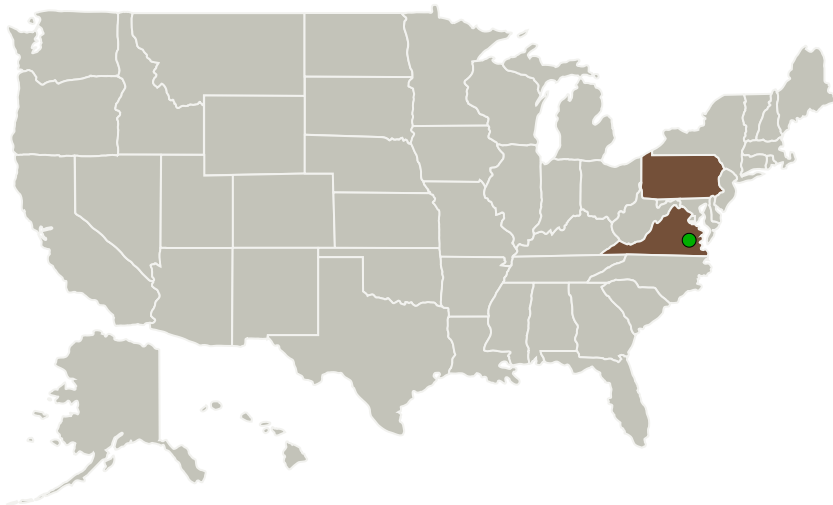
Completed Technology Project (2016 - 2017)



Project Introduction

Fibertek, Inc. in partnership with researchers at the Pennsylvania State University Center for Innovative Materials Processing through Direct Digital Deposition (CIMP-3D) are proposing to develop a state of the art, space-qualifiable laser transmitter that meets the requirements of the flash lidar transmitter defined in the 2016 STTR subtopic T9.01, Navigation and Hazard Avoidance Sensor Technologies. The design will be an innovative synthesis of key technologies that results in a >3x reduction in the size and weight and a >2x increase in the efficiency of the laser transmitter previously developed for the Autonomous Landing and Hazard Avoidance Technology (ALHAT) demonstrator program. These key technologies include incorporation of additive manufacturing techniques to develop a much lighter weight mechanical structure, an ultra-compact unstable or near stable ring resonator that achieves a large fundamental mode in an ~ 7 cm x 4 cm rectangular optical cavity, higher efficiency diode-pumped head designs that incorporate composite gain media, and compact and efficient electronics designs derived from the environmentally hardened versions previously developed for DOD and NASA programs.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Fibertek, Inc.	Lead Organization	Industry	Herndon, Virginia
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

Pennsylvania	Virginia
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Project Transitions

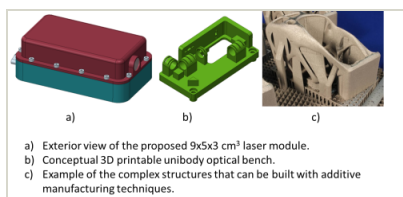
▶ **June 2016:** Project Start

✓ **June 2017:** Closed out

Closeout Documentation:

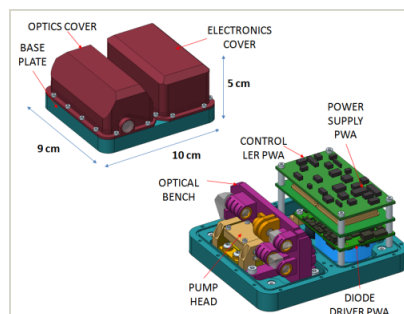
- Final Summary Chart(<https://techport.nasa.gov/file/141344>)

Images



Briefing Chart Image

Ultra-Compact Transmitter for Space-Based Lidar, Phase I
(<https://techport.nasa.gov/image/131595>)



Final Summary Chart Image

Ultra-Compact Transmitter for Space-Based Lidar, Phase I Project Image
(<https://techport.nasa.gov/image/135392>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Fibertek, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

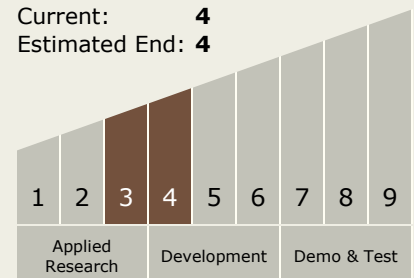
Carlos Torrez

Principal Investigator:

Nicholas W Sawruk

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.3 Landing
 - └ TX09.3.1 Touchdown Systems